

We claim:

1. A double-acting pump for ejecting a product from a container, the pump comprising,

a housing,

a piston with an axial bore axially slideable in the housing, wherein the piston is sealed by a first housing portion,

a hollow piston rod which extends the axial bore of the piston, wherein the hollow piston rod is displaceable in an opening of a closing cap for the housing and container, wherein the hollow piston rod has at a free end thereof a tightly attached actuating head, wherein, when the actuating head is actuated, the piston builds up a pressure against a force of a restoring spring in a pressure chamber of the housing,

wherein the actuating head contains an outlet duct connected to the bore and extending through a check valve to an ejection opening for the product,

wherein at least one opening is provided in a second housing portion between the first housing portion and the closing cap,

wherein, in a non-actuated state of the pump, the piston releases under the force of the restoring spring a passage

between the pressure chamber and the at least one opening in the second housing portion,

wherein a section of the outlet duct adjacent the check valve has between an inner and an outer cup-shaped sleeve of the actuating head, which sleeves are laterally tightly placed against each other, a groove formed on an outer side of the inner sleeve,

wherein the groove is covered by the outer sleeve and extends up to an expansion chamber formed in front of an outlet opening formed in a bottom of the outer sleeve,

wherein a germ-killing and bacteria-killing medium is arranged in the expansion chamber, wherein the medium permits flow of the liquid to the outlet opening,

wherein a dispensing stroke volume of the piston is equal to a volume of the drop of the liquid, and

wherein a width of the outlet opening is selected to prevent a spraying effect.

2. The double-acting pump according to claim 1, wherein the passage is formed by at least one axial groove in an inner side of a middle housing portion arranged between the first and second housing portions.

3. The double-acting pump according to claim 1, wherein the germ-killing and bacteria-killing medium comprises an alloy of silver and copper.

4. The double-acting pump according to claim 1, wherein the germ-killing and bacteria-killing medium is comprised of a helix which surrounds an inner end of the inner sleeve and leaves sufficient space for an unimpaired flow of the liquid to be dispensed.

5. The double-acting pump according to claim 1, wherein an annular air filter is tightly inserted so as to rest against the piston rod in a recess surrounding the piston rod adjacent an opening of the closing cap, wherein the air filter is impermeable to germs.

6. The double-acting pump according to claim 5, wherein the filter comprises a silver/copper alloy and activated carbon.

7. The double-acting pump according to claim 1, wherein the actuating head comprises a pipe piece extending coaxially with the piston rod and the closing cap comprises a pipe piece extending coaxially to the piston rod, wherein the pipe

pieces engage almost tightly in each other and are movable relative to each other in an axial direction, wherein the movement is limited by undercuts.

8. The double-acting pump according to claim 1, wherein an opening rim of the housing is snapped into an annular groove of the closing cap with a snap seat.